associated with iron and platinum in a circuit. The arrangement is given in fig. 65, where D, E represent two test-glasses containing the strong solution of sulphuret of potassium (800); and ^also four metallic plates, about 0.5 of an inch wide and two inches long in the immersed part, of which the three marked P, P, P were platinum, and that marked I, of clean iron: these were connected by iron and platinum wires, as in fig. 65, a galvanometer being introduced at G. In this arrangement there were three metallic contacts of platinum and iron, *a, b,* and *x:* the first two, being opposed to each other, may be considered as neutralising each other's forces; but the third, being unopposed by any other metallic contact, can be compared with either the difference of *a* and *b* when one is warmer than the other, or with itself when in a heated or cooled state (818), or with the force of chemical action when any body capable of such action is introduced there (819).

813. When this arrangement is completed and in order, there is absolutely no current circulating through it, and the galvanometer-needle rests at o°; yet is the whole circuit open to a very feeble current, for a difference of temperature at any one of the junctions *a, b,* or *x,* causes a corresponding thermo current, which is instantly detected by the galvanometer, the needle standing permanently at 30° or 40°, or even 50°.

814. But to obtain this proper and normal state, it is necessary that certain precautions be attended to. In the first place, if the circuit be complete in every part except for the immersion of the iron and platinum plates into the cup D, then, upon their introduction, a current will be produced directed from the platinum (which appears to be positive) through the solution to the iron; this will continue perhaps five or ten minutes, or if the iron has been carelessly cleaned, for several hours; it is due to an action of the sulphuretted solution on